DIGITAL HEALTH & CARE INSTITUTE

Our Time to Shine: Empowering the Data, Information and Knowledge Workforce as a Driving Force for Digital Health and Care

Appendix 2:

High level mapping of relevant existing capability/competency/career frameworks

August 2019

a collaboration between

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Main report: Our Time to Shine : Empowering the Data, Information and Knowledge Workforce as a Driving Force for Digital Health and Care

Appendices

Appendix 1: Scoping review of the literature on workforce models, workforce planning and development approaches

Appendix 2: High level mapping of relevant existing capability/competency/career frameworks

Appendix 3: Emergent themes from consultation with strategic stakeholders

Appendix 4: Baseline workforce survey

Appendix 2: High level mapping of relevant existing capability/competency/career frameworks.

Introduction

This paper provides a high-level mapping of existing capability/competency/career frameworks relevant to the special data, information and knowledge workforce in health and care in Scotland. It is informed by:

- Early discussions of the project steering group
- Literature search
- Interviews with strategic stakeholders

It is anticipated that this initial mapping will be augmented through iterative engagement with stakeholders and finalised in the final SDIK Scoping Report to provide a composite overview of data, information and knowledge workforce capabilities to date[1].

Overarching health and social care frameworks

It will be important to map any capability framework/s for the specialist data, information and knowledge workforce onto the overarching frameworks relevant to the majority of staff in health and social care in Scotland, see table 1. As well as being targeted to NHS and social care staff, these have slightly different foci:

- Progressive remuneration and job banding/grading: Agenda for Change and the Knowledge and Skills Framework
- Learning, skills, capability development that may or may not be linked to job banding (NHS Career Framework, SSSC Continuous Learning Framework).

Table 1: Overarching frameworks

Organisation	Framework	Capabilities, Competencies or Careers
NHS	Agenda for Change[2]	Job grades
NHS Scotland	The Knowledge and Skills Framework	Knowledge & Skills framework
Scottish Government	Guidance On The Career Framework For Health	Career Framework
SSSC	Continuous Learning Framework	Learning framework

All hyperlinks last accessed in August 2018

Specialist Data, Information and Knowledge Frameworks

The initial mapping has identified 13 frameworks that appear to be relevant to the SDIK workforce in health and care in Scotland, see table 2.

[1] See Call for Proposals, Requirement 3

[2] Note that doctors and dentists are not covered by Agenda for Change and the Knowledge and Skills Framework.

The frameworks variously cover the SDIK core functions agreed by the Project Steering Group at its meeting on 13th July 2018, namely:

- Identify user needs for data, information and knowledge (DIK)
- Curate, organise, manage and quality assure DIK
- Source, capture and select DIK
- Analyse, interpret, synthesise DIK
- Transfer, share and spread DIK to relevant users
- Present and communicate DIK to make it usable and accessible when and where it is needed by decision-makers (e.g. visualisation, action summaries).

Analysis indicates that that the frameworks best relate to (in order):

- Analyse, interpret, synthesise DIK (9 frameworks)
- Present and communicate DIK to make it usable and accessible when and where it is needed by decision-makers (e.g. visualisation, action summaries) (8 frameworks)
- Curate, organise, manage and quality assure DIK (7 frameworks)
- Source, capture and select DIK (5 frameworks)
- Identify user needs for data, information and knowledge (DIK) (5 frameworks)
- Transfer, share and spread DIK to relevant users (4 frameworks)

Additional functions addressed by the frameworks included

- Generic skills, such as teamworking, leadership, communication (5 frameworks)
- ICT-specific functions (3 frameworks)
- Functions specific to clinical/biomedical professions (2 frameworks)

It should be noted that

- Nine out of the 13 frameworks are specific to the health workforce; none are specific to the care workforce; three are generic UK government frameworks; and one is an international framework (SFIA) relating to ICT staff.
- One framework was developed by the National Institutes for Health in the US.
- One framework is organisationally rather than individually focused:
    - Health Education England's Knowledge for healthcare: a development framework for NHS library and knowledge services in England 2015-2020
- Two frameworks relate to professional standards for healthcare scientists and clinical scientists rather than to capabilities/competencies/career development.

Table 2: Potentially relevant Frameworks

Organisation	Date	Country	Framework	Health & Care	Capabilities, Competencies or Careers	SDIK specific	Scope	Transferable across SDIK roles	CORE SDIK FUNCTIONS (agreed by project steering group on 13 July 2018						Other identified functions	Notes
									Identify user needs	Curate, organise manage, QA	Source, capture select	Analyse, interpret, synthesise	Transfer share, spread	Present, communicate make usable & accessible		
Academy for Healthcare Science	?	UK	Good Scientific Practice for healthcare scientists	1	Standards	0	Healthcare scientists	0	0		1	1	1	1		Maybe relevant
British Computer Society	2011	UK	Health Informatics Career Framework	1	Career	1	Health Informatics	1	0	1		1	0	0	ICT Records staff Clinical Informatics Trainers	Indicatively linked with NHS KSF and relevant NOS
Health & Care Professionals Council	2014	UK	Standards of Proficiency for Clinical Scientists	1	Standards	0	Clinical scientists	0	0	0	0	0	0	0		Maybe relevant
Health Education England	2017	UK	Knowledge for healthcare : a development framework for NHS library and knowledge services in England 2015-2020	1	Development framework	1	Knowledge /library services	1	1	1	1	1	1	1		Focus on organisational development NOT workforce development - states that need to invest in workforce and career development but no detail
National Institutes of Health	?	US	Suggested Information Technology Management (GS-2210) Competency Model.	1	Competencies	1	IT managers in health	0	0	1	0	0	0	0	Health Informatics Teamwork etc	
NHS Education for Scotland	2012	UK	A Capability Framework for NHS Scotland's Knowledge Broker Network	1	Network capabilities	1	Knowledge broker **network**	1	1	1	1	1	1	1	Leadership Organisational capacity Networking Teamwork	Was the basis for the development of a blended learning programme
NHS Health Scotland (Public Health	2016	UK	The Public Health Knowledge	1	Career	0	Public Health	0	0	0	1	1	0	1	Leadership Teamwork	

England, Public Health Agency & Public Health Wales)			and Skills Framework													
NHS National Services Scotland	?	UK	Your skills framework: data management staff workbook	1	Career	1	Data management	1	1	1	0	1	0	1	Teamworking Communication Leadership	Aligned with AfC bands
NHS National Services Scotland	?	UK	Your skills framework: Analyst workbook	1	Career	1	Analyst	1	1	1	0	1	0	1	Teamworking Communication Leadership	Aligned with AfC bands
SFIA Foundation	ongoing	International	Skills Framework for the Information Age		Skills framework	ICT	Information & Communications technology	??							ICT	NES used this to develop framework for ICT staff
UK Government	2017	UK	Digital, Data and Technology Profession Capability Framework		Capabilities	1	Digital, Data & Tech	1	1	0	1	1	1	1	IT	Data, IT, Product & Delivery, QAT, Technical and User Centred job roles and skills levels
UK Government	2016	UK	The Government Statistician Group (GSG) Competency Framework		Competency	1	Statisticians & Statistical Data Scientists	1	0	0	1	1	0	1	Customer focused	
UK Government	2016	UK	HM Government KIM skills framework		Professional skills	1	Knowledge & Information Management PLUS guidance for 6 core roles	1	0	1	0	0	0	0		updated 2009 version
					TOTALS	9		8	5	7	5	9	4	8		
Organisation	**Date**	**Country**	**Framework**	**Health & Care**	**Capabilities, Competencies or Careers**	**SDIK specific**	**Scope**	**Transferable across SDIK roles**	**Identify user needs**	**Curate, organise manage, QA**	**Source, capture select**	**Analyse, interpret, synthesise**	**Transfer share, spread**	**Present, communicate make usable & accessible**	**Other identified functions**	**Notes**
									CORE SDIK FUNCTIONS (agreed by project steering group on 13 July 2018							

All hyperlinks last accessed in August 2018

Frameworks that are not relevant

Ten frameworks were identified that are not (at this juncture) considered to be relevant/within scope because:

- They are relevant to all staff working in health and care, but not specialist DIK staff (5 frameworks)
- They are not relevant to SDIK staff working in health and care (2 frameworks)
- They are only available to members (2 frameworks)
- They have been recently updated (1 framework)

See Appendix A.

Potential risk of over-focus on specialisms?

The literature search and consultation with senior stakeholders both confirmed the diverse range of frameworks available for individual professional groups – e.g. data scientists, coders, health records staff, librarians, information managers, knowledge managers etc. Both methods of investigation also uncovered that there is there is potential for the specialist groups within the data, information and knowledge workforce to become factionalised, with groups representing different aspects or functions striving to establish specifically defined knowledge/capability terrains. Some of this drive to assert distinctive professional identities that differentiate specific groups from other data, information and knowledge workers seems to be a response to the changing digital and healthcare environments, as professionals recognise the need to clarify and consolidate their role in the changing landscape.

At the same time, this paper highlights that mapping across frameworks, and at least two published studies, show considerable commonality and transferability across functions. From a health and social care delivery perspective, the priority is to establish new service needs for data, information and knowledge, and to equip this workforce to meet those needs. As with other health and care professions, this changing landscape is likely to challenge traditional professional boundaries, entailing a need for extended skills and roles and for new forms of collaboration.

A core issue for this project will be to consolidate and clarify specialist data, information and knowledge functions and capabilities in a way that affirms their value to health and care – while at the same time recognising that these functions are undergoing significant change.

Overarching Health Data, Information and Knowledge Specialist Frameworks

To counterbalance the focus of individual frameworks on particular specialisms, two studies have been identified so far which take a broad view of health informatics as an overarching discipline and scope competencies across a diverse range of professional groups.

Hovenga and Grain 2016[3] argue for the need to establish a *"globally agreed well-structured framework representing the health informatics discipline's body of knowledge".* They observe that professions that relate to health informatics, such as software engineers, computer scientists, information and communication technologists, health information managers, clinicians, biomedical scientists, and others representing a number of different professions have *"each defined their own body of knowledge that describes their specific knowledge and skills domain."* Further, they note that *"Due to the extensive breadth and depth as well as the overlaps between and blurring of the boundaries of a number of these well-established knowledge domains, it is difficult to gain consensus regarding a unique body of knowledge for the health informatics domain".*

They consider that a formally documented body of knowledge *"sets the standard for professional practice, endorsement and accreditation criteria"*, and that it needs to have *"sufficient flexibility to enable the inclusion of new knowledge in a timely fashion".* They also assert that if a formally document body of knowledge was to be developed for health informatics, it would enable it to identify key competencies and associated skills, knowledge and attributes to suit different types of health care organisations; to provide a foundation for health informatics learning, education and training; and as such, to develop its professional standing.

Hovenaga and Grain 2016 consider that the health informatics body of knowledge needs to be fully integrated within all of the more *"traditional"* professions that relate to health informatics *"as and where appropriate".* They suggest that a health informatics body of knowledge may be viewed as an *"umbrella structure that accommodates, respects and calls on specialist contributions as and when required" through "strong multidisciplinary teamwork".*

They review the following frameworks specific to health informatics professionals:

- International Medical Informatics Association Knowledge Base (2009) was developed as a joint project between IMIA, the British Computer Society's Health Informatics Forum (BCSHIF) and CHIRAD (UK Health Informatics R&D intelligence)[4]
- The Canadian HIP competency framework (2012)[5]
- The UK Council for Health Informatics Professionals (UKCHIP)[6] registration scheme for 3 levels of health informatics professional using standards and an agreed code of conduct[7].

[3] Evelyn Hovenga; Heather Grain (2016): Learning, Training and Teaching of Health Informatics and its Evidence for Informaticians and Clinical Practice: Evidence-Based Health Informatics

[4] http://imia-medinfo.org/wp/imia-endorsed-documents/

[5] https://www.coachorg.com/en/resourcecentre/resources/Health-Informatics-Core-Competencies.pdf

[6] It must be noted that in 2018, UKCHIP announced that "BCS, The Chartered Institute for IT, the UK Council of Health Informatics Professions (UKCHIP) and the Institute of Health Records and Information Management (IHRIM) are working collaboratively to create a new federation for the Informatics profession. The three autonomous bodies will work closely together in a federation to ensure that UK health informatics is recognised as a valued profession."
http://www.ihrim.co.uk/index.php?option=com_tags&view=tag&id=56%3Aukchip

[7] http://www.ihrim.co.uk/index.php?option=com_tags&view=tag&id=56%3Aukchip

- The Career Framework for Health Informatics Professionals (2011)[8], which shows how other frameworks, including UKCHIP are linked to the HIFC.

Hovenga and Grain 2016 looked particularly at the Skills Framework for the Information Age (SFIA). They consider that SFIA's success is demonstrated by its widely accepted global use: it provides a common language, is regularly updated, and is used in many contexts by educators, human resource managers (employers), professional organisations and individuals for career planning purposes in most countries around the world: *"It provides a common reference model incorporating unambiguous and clear definitions of IT based technical skills as well professional skills (totalling 96), along with definitions for up to seven skills role requirements".* See table 2.

However, **they conclude that the SFIA framework is**

> ***"not well suited for the health informatics body of knowledge and its applications, although the SFIA logical structure can be replicated. Health informatics requires formal naming and definitions of the concepts and fields represented within its domain together with clear definitions. The SFIA framework structure enables its use as a management tool as well as enabling the identification of suitable codes for the inclusion into a Standard Occupational Classification system. This is useful for the purpose of workforce planning and associated activities."***

Table 2: Topics used in the SFIA Framework Structure

High Level Topic groups	Levels of responsibility	Generic skills defined for each level
Strategy and architecture – incl. governance, planning, consulting	1. Follow	**Autonomy:** Has authority and responsibility for all aspects of…
Business change –incl. staff development, project management	2. Assist	**Influence:** Makes decisions critical to organizational success….
Solution development & implementation – incl. socio-technical, data/system integration	3. Apply	
Service Management – all operational functions	4. Enable	**Complexity:** Leads on the formulation….
Procurement & Management support – incl. supply chain, compliance, risk & quality management	5. Ensure/advise	
Client interface – incl. sales, client support, user interaction	6. Initiate/ influence	**Business skills:** Has a full range of strategic management and…..
	7. Set strategy, inspire, mobilise	

Adapted from Hovenga and Grain 2016

[8] https://www.hicf.org.uk/AboutHICF.aspx

Overall, Hovenga and Grain 2016 conclude that

> *"most individual competency statements reviewed consisted of multiple concepts such as topic plus level of responsibility or role context in any one statement";*

But they also assert that

> ***"making use of the globally endorsed SFIA structured framework as a model for developing a similar framework to suit the health informatics knowledge domain based on the IMIA educational guidelines and knowledge base would be beneficial".***

In the second study which takes an overarching perspective on specialist data, information and knowledge roles, Fraser-Arnott 2016[9] provides an analysis of the competency profiles of librarians, records managers, information managers, archivists, and knowledge managers to develop a competency profile for information specialists that incorporates the knowledge and competencies from all of these areas. She notes that the volume of information resources is ever-increasing, and that there is a growing need for information specialists to work together and remove the barriers that have been established between them based on the types of information resources that they manage. She considers that

> *"This collaboration will require information specialists to develop a better understanding of each other's roles and may ultimately result in the creation of new hybrid roles in which employees may need to be able to perform the functions of all of these disciplines as well as some new ones as we have seen through the newer discipline of knowledge management."*

The sources used by Fraser-Arnott 2016 for this analysis were 16 existing competency profiles developed by professional associations and employers of information workers such as government agencies.

1. American Association of Law Libraries 2011: Competencies of law librarianship
2. American Libraries Association 2009: ALAs core competences of librarianship
3. ARMA International 2007: Records and information management core competencies
4. Association of Canadian Archivists: 2014 Competencies for archivists and records managers
5. Australian Society of Archivists & Records Management Association of Australasia 2010: Tasks, competencies and salaries for recordkeeping professionals
6. Australian Society of Archivists & RIM Professionals Australasia Joint Education Steering Committee 2011: Statement of knowledge for recordkeeping professionals
7. Canadian Association of Research Libraries 2010: Core competencies for 21st century CARL librarians
8. Canadian General Standards Board 2009: Competencies of the Federal Government Information Management Community (not freely available)
9. Government of Alberta 2004: Records management competency profiles
10. Government of Newfoundland and Labrador (no date): Information management competency framework
11. Library of Congress 2011: Competencies for Federal Librarians

[9] Melissa Fraser-Arnott, (2017) Competencies for information specialists in emerging roles, Library Management, Vol. 38 Issue: 1, pp.65-76, https://doi.org/10.1108/LM-09-2016-0074

12. Office of the Chief Information Officer (Canada) 2009: Technical competency framework for information management
13. Social Care Institute for Excellence (no date): Competencies for knowledge management
14. Special Libraries Association 2003: Competencies for information professionals of the 21st century
15. TFPL 2011: Knowledge and information management competencies
16. UK National Archive 2009: Government knowledge and information management professional skills framework [updated in 2016 to the KIM framework]

She found that the definitions of the types of information professionals covered by the competency frameworks and the types of roles they occupied were

> *"quite revealing about the nature of different information roles. In some cases, the targeted professionals were very clearly defined and represented a highly specialized function and in others the competency profiles suggested a broad definition of the roles carried out by information specialists and the professional or educational backgrounds of those who occupied those roles."*

The competency profiles that were found online for librarians, records managers, information managers, archivists, and knowledge managers revealed that the borders between these disciplines are highly blurred. Fraser-Arnott 2016 concluded that

> *"If viewed at a superficial level, the focus of the competency profiles were all very different in terms of the types of tasks performed, and the level of detail provided. When examined together, however, it was discovered that there was a significant amount of overlap in terms of the competencies required by the various information disciplines, even though the specific tasks, background knowledge, and emphasis of each of the disciplines may have been somewhat different."*

Table 3 provides Fraser-Arnott's analysis, which identifies five *"competency groups"* for information specialists, each with several more specific competencies. Her objective was to create a brief list of competencies that apply to each of the groups **without favouring one discipline or hierarchical level**; and which can be used as a tool for information professionals in planning their learning and professional development activities and facilitating communication between information professions with various information backgrounds.

Table 3: Competencies for information specialists

Competency group	Specific competencies
Collaboration, client service and communication	1. Advocates, markets, and promotes information programmes and services 2. Builds relationships with internal and external partners 3. Provides customer service to internal and external clients 4. Communicates orally and in writing 5. Engages in active listening and ensures that communications with clients have been effective 6. Develops and implements communication strategies 7. Assesses the training needs of the organization

	8. Develops and delivers training resources and sessions 9. Engages in effective change management activities 10. Resolves conflict 11. Knowledge of training principles and practices
Organisational understanding and strategic alignment	1. Understands the organizational environment 2. Explores and analyzes the organizational environment and user needs 3. Engages in trends monitoring and analysis 4. Builds organizational and user needs knowledge into information tools and processes 5. Support effective decision making in the organization 6. Aligns resources with strategic goals
Programme and service delivery and management	1. Knowledge of leadership and management principles and practices 2. Manages human resources 3. Manages budgets and procures necessary goods and services 4. Manages facilities and equipment 5. Engages in risk management, business continuity, and emergency management activities 6. Designs and develops new programmes and services 7. Delivers programmes and services 8. Monitors and evaluates programmes and services 9. Innovates to improve programmes and services 10. Ability to use technology in the workplace
Records, information and knowledge management technical competencies	1. Serves as the organizational subject matter specialist on information services through an understanding of records and information principles, practices, and procedures 2. Physically processes information resources 3. Engages in digitization and image management activities 4. Ensures that information is managed throughout its lifecycle 5. Understands, evaluates, and promotes organizational compliance with information-related legal, regulatory, and policy requirements 6. Designs and implements information organization systems 7. Promotes and supports data and information quality 8. Supports research, knowledge sharing, and collaboration 9. Conducts research and retrieves information from a variety of internal and external sources
Personal qualities	1. Adaptability and flexibility 2. Teamwork and collaboration 3. Values and ethics 4. Initiative 5. Time management and working under pressure 6. Analytical thinking and decision making 7. Commitment to continuing professional development

Adapted from Fraser-Arnott 2016

Appendix A: Frameworks that are not relevant

Organisation	Date	Country	Framework	Capabilities, Competencies or Careers	Scope	Notes
Association for project management	2015	UK	New APM Competence Framework 2nd edition	Competencies	Project management	Only available to members
British Computer Society	2008	UK	Competency Framework for Chief Information Officers and Senior IT Leadership Positions	Competencies	Chief Information Officers and Senior IT Leaders	Not relevant to SDIK in health and care
Digital Analytics Association	?	US	Digital Analyst Competency Framework	Competencies	Digital Analysts	Only available to members
HITCOMP	2017	EU & US	Health Information and Technology Competencies: HITCOMP tool and repository	Competencies	IT capabilities required by healthcare staff	Not relevant to SDIK in health and care: EU and US development
NHS Education for Scotland	2017	UK	Career Development Framework for Health Protection Nurses	Career	Health Protection	Not relevant to SDIK. Used 2006 Framework for Health Protection as basis
NES & Health Protection Scotland	2006	UK	Framework for Workforce Education Development for Health Protection in Scotland	Workforce education development	Health Protection	Not relevant to SDIK Used the NHS career framework rather than AfC as basis
NHS Education for Scotland/SMCIA	2014	UK	Scoping the potential for a core capability framework for using technology to support	Capabilities	All health and care staff	Not relevant to SDIK

			improvement and transformation of health and social services.			
Open Data Institute	?	UK	Open Data skills framework	Skills framework	Open data for all staff	Not relevant to SDIK
SFIA Foundation	ongoing	International	Skills Framework for the Information Age	Skills framework	Information & Communications technology	NES used this to develop framework for ICT staff
Social Care Institute for Excellence	Early 2000s?	UK	Competencies for Knowledge Management	Competencies	All social care staff	Not relevant to SDIK
UK Government	2009	UK	Government Knowledge and Information Management Professional Skills Framework	Professional skills	Knowledge & Information Management	Updated in 2016

All hyperlinks last accessed in August 2018